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CALIFORNIA EROSION DIGEST

VOLUME 1 - No 3

DECEMBER 1934



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HARRY E. REDDICK
REGIONAL DIRECTOR

SANTA PAULA
CALIFORNIA

CALIFORNIA EROSION DIGEST

U. S. SOIL EROSION SERVICE, DEPARTMENT OF THE INTERIOR
Issued monthly by California Erosion Control Project

HARRY E. REDDICK, REGIONAL DIRECTOR

SANTA PAULA, CALIFORNIA

Volume 1, No. 3

December 1934

OUR LAND

As Americans, just what does the oath of allegiance mean to you and me? When we salute the flag, are we thinking only of the America we will know during the brief span of years in which we are a living part of it, or is that a salute to the glory and success of America to-day, to-morrow, and forever? Three generations ago you and I were unthought of; three generations from now we will be dust, and forgotten, but our country must live on through the ages. Has any man the right to call himself a true and loyal American who does not see and consider the destiny of his country beyond the day when he himself will no longer be a living part of it?

Our ancestors lived by the theory that it was up to each generation to take all that it could from the land, and let the future generations take care of themselves. As a result of their attitude, plus a ~~lack~~ of knowledge regarding the menace of soil erosion, there are today thousands of abandoned farms in the East and Midwest; there are even a few in our own California.

We are one of the youngest of nations, and undoubtedly one of the most prosperous, on earth. Some day this country must be as old as China is today. The Chinese are laboriously scooping from the bottoms of the canals the soil that their forefathers wasted. Some day our country will be as old as Japan is today. The Japanese are spending several times the value of an acre of land to protect cultivable land below and insure its being permanently productive. Some day your descendants and mine will want land at any price, as do the modern descendants of the Caesars in Italy today, where Mussolini is spending hundreds of millions of dollars to reclaim the marshes and give his people fertile productive soil. Fortunately, here in California our land has not been abused for milleniums.

Our country! You and I would fight and die in its defense if necessary, but what are we doing to protect it for those of our own blood who will have to live on it a hundred years from now? Soil erosion is robbing our nation just as surely as it did those once prosperous nations whose present citizens struggle for an existence on starved and impoverished farm lands. What do you think about it? No country can ever be greater than the men who till its soil.

-- Harry E. Reddick.

LEGUMES IN RELATION TO EROSION CONTROL IN THE LAS POSAS AREA.

by
Richard Baker, Junior Agronomist

The legume family is the second largest family of flowering plants, embracing 12,000 species in about 550 genera. The members are widely distributed over the world, but are mostly tropical or sub-tropical.

There is no single character common to all members of this family, but a few of the most prominent characteristics may be noted. The fruit is typically a pod. MEMBERS MAY BE HERBS, SHRUBS, OR TREES.

There are several native or naturalized species of legumes in the Las Posas area. There are two species of Lupine. One is a low growing herb usually not over one foot high; the other is a bushy type, attaining a height of 4 or 5 feet. Bur clover is an introduced plant occurring on abandoned fields and pasture land. It is of fair forage value. Sweet clover has also been introduced and is found in waste places. A true clover has been found in only one place on the area. Spanish clover is an herb having the same habit of growth as bur clover and is fairly common on pasture land. "Loco weed" occurs sparingly throughout the area. (This weed is called Astragalus pycnostachys).

The cultivated species of legumes in California are of considerable commercial importance, because they furnish edible seeds or oil, and many are important forage plants. All legumes are considered valuable because they serve as a means of replenishing the nitrogen supply of the soil.

A brief outline showing the utility of different groups of cultivated legumes.

Legumes grown for seed:
Tepary bean, Navy bean, small White,

Blue pod, Robust, Great Northern, large White, Pink, Bayo, Red Mexican, Cranberry, Pinto, Lima bean, peas, lentil, peanut, soybean, cowpea, fenugreek, horse beans.

Oil Crops (Oil extracted from seed) Peanut, Soybean.

Forage and Cover Crops

Hay: *Field peas, Lathyrus, *Vetch, *Subterranean clover, Soybean, Mung bean, Dolichos, *Lespedeza, *Sweet clover, Cowpea, *Alfalfa (perennial).

Pasture: *Field peas, *Subterranean clover, Soybean, Mung bean (very limited), Dolichos, *Lespedeza, *sweet clover, Cowpea, *Alfalfa (perennial), Trefoil, *Pigeon pea, *Lotus (perennial), *Fenugreek, Velvet bean, *Kudzu (perennial), *Hedysarum (perennial).

Cover. *Field peas, Lathyrus, *Vetch *Subterranean clover (perennial), Soybean, Mung bean, Dolichos, *Lespedeza, *Sweet clover, Cowpea, *Alfalfa (perennial), *Fenugreek, Velvet bean, Trefoil, *Pigeon pea, *Lotus (perennial), *Kudzu, Matbean, *Sainfoin (perennial), *Hedysarum (perennial), Sesbania, Jack Bean, Guar.

There are many of those plants that can be used to advantage in preventing erosion. Those that have potential value as such are preceded by an *. There are 12 genera in all. For convenience and clarity they should be divided into groups according to their specific use. Winter cover crops, strip crops, pasture crops, barranca and gully control plants.

Winter Cover Crops

1. Canadian Field peas. This crop is

similar to vetch in type of growth and tonnage produced.

2. Hairy vetch. A good cover crop for sandy soils. The type of growth is viny, being very similar to peas.

Purple vetch. Grows at somewhat lower temperatures than common vetch. Has a viny type of growth.

Common vetch. Also a viny type.

3. Biennial white flowered sweet clover. This plant has a thick deep tap root valued because it penetrates hard subsoils. It is erect in growth.

4. Bitter clover. An annual, yellow flowered. Bitter clover useful only as a cover crop.

5. Bur clover. A good cover crop for poor soils. Needs but little moisture. This is a prostrate, spreading, annual.

6. Fenugreek. Grown also for seeds, but is an excellent green-manure crop. It has an erect type of growth similar to alfalfa.

Strip Crops

If annuals are used for strip crops the particular plants to be used must be chosen on the basis of adaptability and good seed habits. There should be an abundance of plants coming from seed each year to maintain the cover necessary. Winter annuals should be used to avoid competition with beans for moisture during the growing season. It is rather doubtful if any of the winter cover crops will prove satisfactory, as strip crop plants, with the exception of *Mollilotus* and *Medicago*.

1. Bur clover may prove fairly satisfactory, but the stand is usually rather sparse and the root system is not very extensive.

2. White flowered biennial sweet

clover will be satisfactory if it can withstand the drought.

3. One of the true clovers should be mentioned at this point because of its peculiar adaptability. This is *Trifolium subterraneum*, or subterranean clover. As the flower matures the sterile calyx is turned down and encloses the fertile flowers, the heads, with the enclosed seeds, being buried in the soil. Because of this interesting characteristic the seed would not spread from the strip crop to the cultivated portion of the field. The type of growth, too, is desirable. It forms more of a mat than bur clover. In this respect it is similar in growth characteristics to the perennial clovers, although it is only an annual. It seems to be adapted to the same conditions as bur clover. At least it is worth trying in small plots if sufficient seed can be obtained.

4. Pigeon pea is a tropical plant. In its native habitat it attains a height of 10 feet, frequently being used as a windbreak in sugar cane fields. It has also been used as a cover crop and as an emergency forage plant. In tropical climates the plant behaves as a perennial, but in this section it is doubtful if it could withstand the rather low winter temperatures.

5. Trefoil is a native perennial of the drier parts of Europe. As it is deep rooted and considered to be drought resistant, it may prove to be a good strip crop plant for this region. It is rather low growing (4-10") and erect, but will form a dense cover.

6. Kudzu is a plant of tropical habitat. It does well in the humid, eastern portion of the United States.

Under field conditions it produces long runners which take root at the joints, forming many individual plants. It is doubtful if the plant will endure the drought of the Las Posas area.

7. Sainfoin is a deep-rooted, long-lived, erect perennial, one to two feet high. It is grown in Southern Europe for forage. It is not known if this plant will withstand the drought of this region.

8. "Sulla" is an erect, perennial legume, attaining a height of two to three feet. It has been tried in several different localities, but not in this particular section of the state. It has been found, however, that growth can be resumed from the root crown after death of the tops, due to a long drought period.

If the strips are to remain for a number of years or indefinitely the original planting will be gradually replaced by native plants. In other words, a natural plant succession for each particular strip or portion of strip will take place until the climax for each is reached. It is not the purpose to discuss the possible plant succession that may take place in any strip or portion of it. The above is merely mentioned to show that full recognition is made of the fact that the strips will not remain as planted the first year. There will be a natural succession of native and naturalized plants until there may be no trace of the original crop planted. However, if an effective ground cover is maintained throughout this succession no steps need be taken to alter it. On the other hand, if the ground cover should be ineffective at a certain stage of the succession, a light reseeding accompanied by necessary seed bed preparation may be required.

Legumes to be used for pastures should be the same as those

found desirable as strip crop plants. In addition Lespedeza may be mentioned. Members of this genus are erect, rather low growing annuals or perennial plants. Lespedeza does well in the humid eastern portion of the United States. It is known to have excellent seed habits, but it is not known if Lespedeza will withstand the drought of this area.

Legumes to be used for planting banks of barrancas or gullies should be the same as those found desirable for strip crops. In addition Ceratonia siliqua, "Carob tree," deserves mention. This tree may prove very desirable as the seed germinates readily and produces a plant of fairly rapid growth. Black locust is also a leguminous tree of considerable importance. It is very drought resistant and has an extensive root system valuable for soil binding purposes. We are planning to set out thousands of black locust trees on this area.

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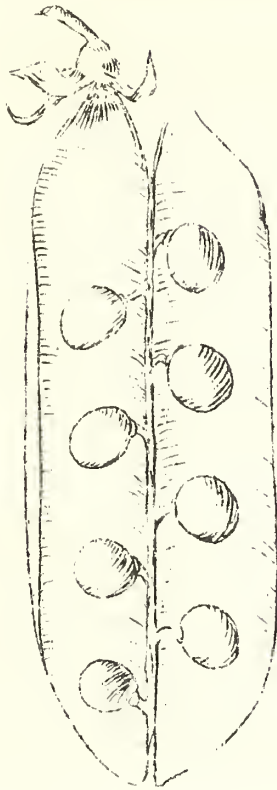
200 Tour Corralitos Project Area.

On December 7 about 200 farmers, extension agents, merchants, and others interested in soil erosion, visited the Corralitos project in Santa Cruz county to observe some of the damage caused by the recent heavy rainstorm there. Press dispatches put the loss at several hundred thousand dollars. Hillside orchards were subject to heavy washing - sheet and gully erosion.

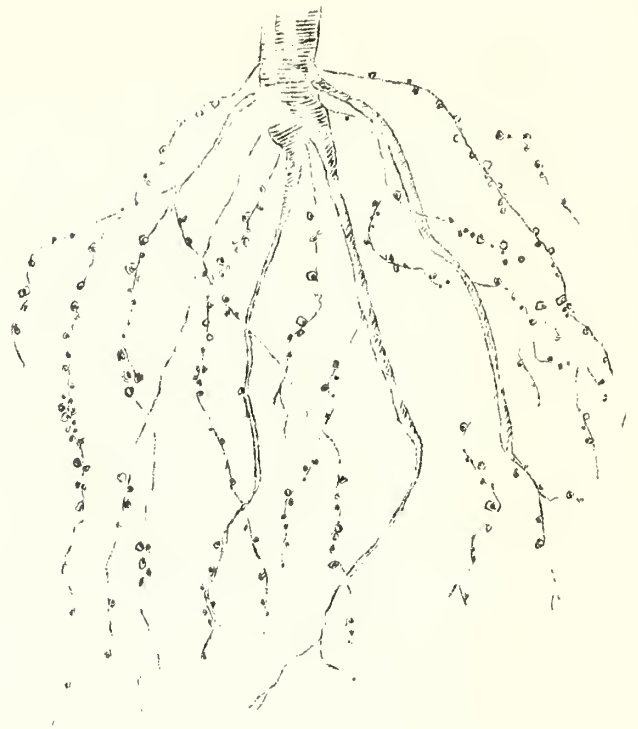
The tour was conducted by the Agricultural Extension Service (Santa Cruz County), in cooperation with the U.S. Soil Erosion Service, Department of the Interior, and the State Forestry Division.

Typical notes of the tour:
"Note eroded hillside orchard on right across bridge -- sheet and gully erosion." "Orchard on left abandoned, to soil washed away, vineyard to follow.

① Typical fruit of legume
Pea -



② Nodules on roots of Soy Bean
(typical of most legumes)



③ Black Locust -
Robinia pseudacacia



④ Sweet Clover -
Melilotu alba



MR. RANCHER, CAN YOU USE A HOLE-DIGGER?

They are free for the asking. First come, first served. All you have to do is hop on the telephone and call L. W. Waters at Santa Paula 500, or Oxnard 968 Y 3. There are no catches. All you have to furnish is the tractor with which to pull the machine, or a tractor's equivalent in horses or mules, with a skinner or driver, and the U. S. Soil Erosion Service provides the machine and a man to supervise its operation. This offer is extended only to those in the Las Posas area, and for a limited time. Those who are interested in trying them out are advised to apply immediately.

Now that you are convinced that there are no strings on the offer it might be well to describe the machine. The hole-digger is a farm tool designed to dig three to five thousand three-gallon holes per acre in land that has a fifteen per cent slope or less. It was invented by a Kansas farmer who was trying to prevent the rains from washing his land away. Percy Wicks, of Moorpark, read a description of the Kansas farmer's machine and, after a session with a few discarded auto parts, built one for himself.

His experiments were so successful that Harry E. Reddick, Regional Director of the U. S. Soil Erosion Service in California, recommended that the Department of the Interior have several built. Mr. Wicks found that not a drop of water ran off his ranch after using the machine, and that in no case were rills or gullies formed. Engineers, under the supervision of John Bamesberger, have estimated that the holes gouged by the machines will adequately take care of a two-inch rain.

Bean farmers on dry land will particularly welcome this implement, as the holes will not only serve as an erosion preventive, but will go a long way in increasing the moisture content of the land treated. From 20 to 30 acres of land can be "holed" in a day, and in most cases it is not necessary to plow beforehand.

Farmers in the Las Posas area are urged to apply for the use of these machines immediately, as they will be offered to other districts in the near future. Remember - it's first come, first served; and the number is Santa Paula 500 or Oxnard 968 Y 3.

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Dr. Walter C. Lowdermilk, vice-director of the U.S. Soil Erosion Service, was a recent visitor. He inspected the work being done in the Las Posas and was also up in Santa Cruz county, going over the erosion situation there.

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Mr. Henry Washburn, farm advisor of Santa Cruz county, and a man who is doing a great deal to make the people "soil erosion conscious" stopped in at headquarters last week, and went over the area.

About ninety per cent of the land in the Temple, Texas, project is in cultivation, and more than sixty-five per cent is farmed by tenants. Majority of the farmers in this region do their work with mules, only a few owning tractors.

-- The Land, Today and Tomorrow

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A marine reef, covered with millions of sand dollars, has been discovered by Howard Gabbert while making a geological survey of the Las Posas demonstration area.

WIND EROSION

Paul Dickey, Junior Agronomist

Last spring I spent ten weeks in Eastern North Dakota, where as good examples of wind erosion occurred as anyone would wish to see. In the time between the last of March and first part of June, six wind and dust storms swept across the northern part of the Great Valley. A wind velocity of 35 to 40 miles per hour was recorded during two of these storms. In each one of these cases a south wind blew during the morning of the day the storm started. About the middle of the afternoon the south wind suddenly stopped and within 5 minutes time a cold northwest wind was blowing and a black wall of dust advanced rapidly. The temperature quickly dropped about 15 degrees, and the wind velocity increased to 35 miles per hour. Trees began to break, hay was blown away, and the stock ran to shelter. It was necessary for the farmers to light lanterns to see to feed and milk the cows and do chores. Although windows and doors of the houses were shut tight, everything inside became covered with a thick layer

of fine black dust. A short lull at six o'clock allowed the last rays of the setting sun to cast a weird light over the countryside, but soon the wind increased again. Enough rain fell in large drops at the beginning of the storm to dot everyone's clothes with mud.

The dust from these storms remained in the air for days and the storms reached the Atlantic coast. No doubt you read of the fog of dust hanging in the air over New York. This dust came from the fields of the northern great plains states -- land that had been cultivated and seeded during a dry spring. Many of the farmers were immediately conscious of the tremendous loss they were suffering, and tractors could be heard day and night pulling plows or cultivators across the fields at right angles to the wind, in an attempt to make furrows that would hold some of the escaping top soil. Roadside ditches 4 to 6 foot deep were filled with fine silt blown from adjacent fields.

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Chester B. Knox, of Moorpark, had a splendid letter in the Ventura Star, on November 26th, giving his views on soil erosion, particularly with relation to the demonstration area in the Las Posas. We quote his letter in part:

Editor, The Star:

The lack of understanding regarding the aims of this project is due to the tendency of the public to let well enough alone when considering a national asset, as we think even at the rate it is being dissipated, there will be enough of it to supply us through our short life. In other words we are willing to let the future generations shift for

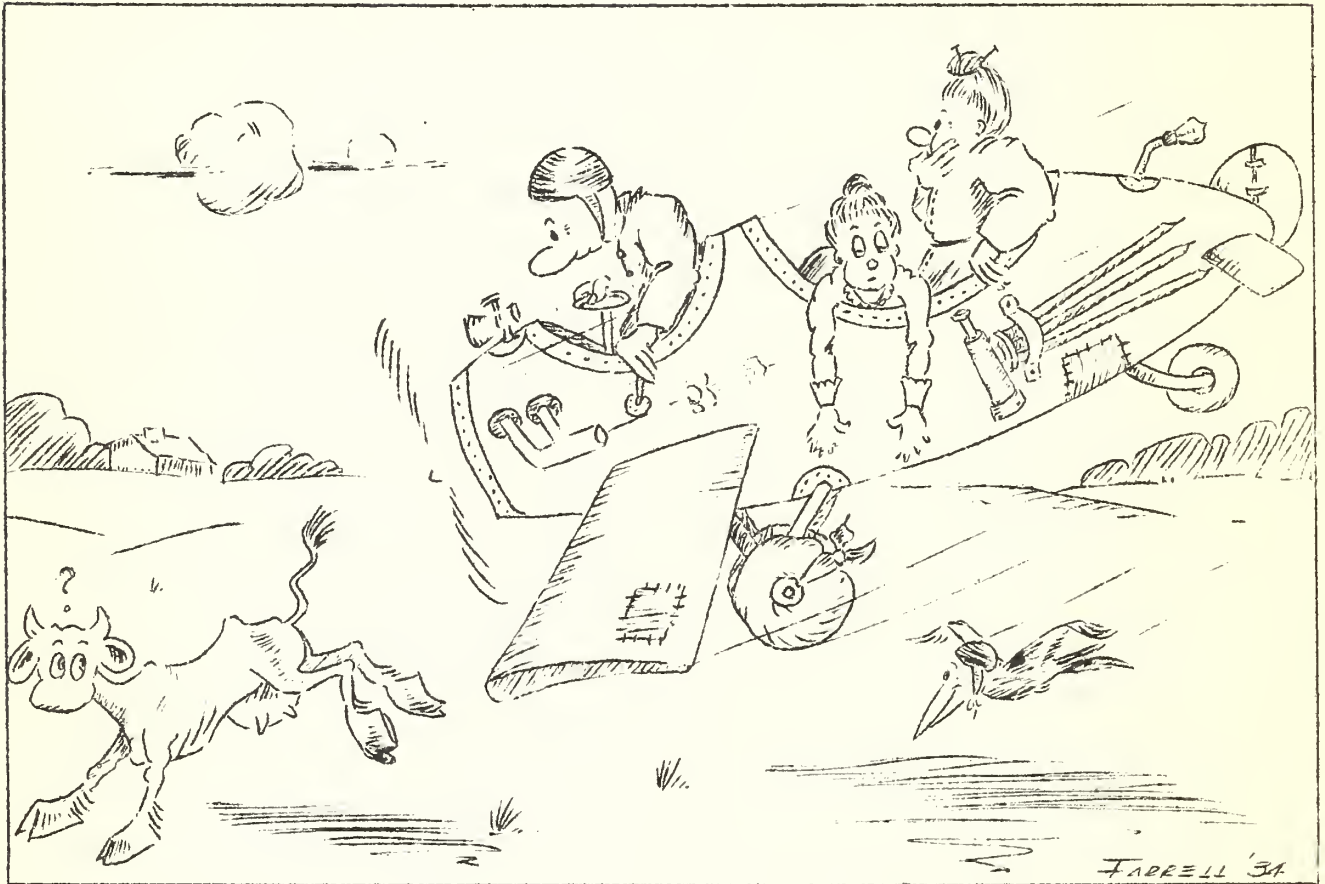
themselves.....

The damage sustained here in the past, especially since the heavy floods of 1884, and the early 60's is deplorable, and the present menace has been heightened by the increasing denudation by farmers of the natural protecting shrubbery..

Fortunately, in a community where the soil is being salvaged and protected, the ones benefited are appreciative and cooperative, and attribute to the soil erosion work the degree of magnitude and beneficence to which it is entitled as a feature of our national protective and conservation policy."

--Chester B. Knox
Moorpark, Calif

“AMONG OUR EROSIONEERS”



Presenting

Harry E. Reddick, Regional Director

Harry E. Reddick (and if we suddenly start referring to him as Mr. Reddick you'll know that he has paid us an unexpected visit) was born in Abilene, Kansas, just forty-two years and four months ago. Harry's youth was filled with peril in various guises. In fact, he almost didn't happen at all, and then -- But, perhaps we had better start at the beginning, or even a little beyond there, so far as the subject of this story is concerned.

Harry's grandmother was a member of an old and proud family of the English aristocracy. See what a narrow escape he had! He might have been dropping 'is blooming "aiches" and riding 'orses today had not fate trumped

in and taken a trick or two. His grandmother migrated from the tight little isles to the wind-swept prairies of Canada and there married a musician. The fact that Harry's grandfather was a musician has little to do with the story, but the fact that Harry's grandfather had a brother who had wandered far away into the wilds of Western Kansas and there became ill had plenty to do with later events.

The relatives in Canada answered the call of distress and once in Kansas soon gave up any idea of returning northward. Among those who made the trip south was a young girl who must have been brave, and pretty, and imbued with ideals. Western Kansas in the days of Quantrell, and the James Boys, and the plagues of grasshoppers that ate the handles from plows, called for courage of a finer sort on the part of its citizens. This young girl attended school and afterwards became the teacher in one of the little red school houses that marked each township on that boundless plain. This marks the scene of Harry's second narrow escape -- and we say that in spite of the fact that he had not yet arrived on the scene. School teachers and geometry books do a lot in providing the world with civil engineers, but it isn't a school teacher that starts the process, though it may often enough be an ex-one. She might have gone on teaching - and think where this story would have been had she done so - but one of the trustees by the name of Reddick offered her the position as private tutor for his family -- if and when. Harry was the first pupil.

When Harry was six years old his father died, and two months after that his younger sister died, and shortly after that he, himself, became ill with a malignant form of malaria. He really didn't have

any good luck at all after that until one morning at the age of eleven he looked out of a chair car window and saw oranges hanging on trees without their tissue paper wrappers, that he had always believed grew around them. His home prior to leaving for the West had been in Iowa.

Arriving in Los Angeles he did as Iowayans do. We don't know how he missed Long Beach, but maybe the station agent back in Iowa had received a quota notice just before he sold the tickets. We have been assured that Harry uphold the reputation of the easterners with zeal and thoroughness. With the aid of a bicycle he made the rounds, including the chamber of commerce, Exposition Park, Selig Zoo, Mt. Lowe, and even Catalina Island. If he really did Mt. Lowe on a bicycle -- well, it's a good thing he didn't have an aeroplane in those days or he would have been flying from Santa Paula to Ventura by the way of Needles, St. Louis, New York, and points East. As for visiting Mr. Wrigley's bird farm on a bike -- we're glad he didn't miss the Island or he might have come up on the beach at Waikiki.

Grammar school finished, he migrated with his parents to a new frontier located a few miles north of Ventura. For three years Harry rode twenty miles a day horseback while attending Ventura Hi. Each day he crossed Ventura River twenty-six times and during the three years he built up a mileage of more than twelve thousand miles horseback, just going and coming. We didn't check his figures on that, but we are presuming that that did not include those extra miles that he rode each day to see a young lady home each afternoon. You know, Harry, mileage of that sort can't rightfully be charged against the difficulties of obtaining an education -- or can it? He was the salutatorian of his class, when he wa.

graduated, and had developed quite a yen for mathematics, while figuring his mileage between the place he bid his girl friend good night and where he lived. These parting miles are long and lonely, as swains have known since time began.

Now he's in college. Or was U.S.C. actually a college in those days? There he met John Bamesberger -- but John hasn't a chance in this story -- not with a fraternity house and a sorority house on two adjoining lots. Harry worked his way thru school. Poor boys had to work their way in those days, because there weren't any football teams to play on. Anyway, Harry cleaned up tennis courts, crammed knowledge into Freshmen, played housemaid at a fraternity house, and still had time to size up his noisy neighbors next door.

There was a fight to a finish -- or is it finished yet? The sorority girls next door bombarded the masculine barracks with cold cream jars (empty), heel darning gadgets, and other handy "white elephants." They were wrathful, and with reason. One of their spies had discovered that the embryo engineers were actually studying books at night. The mistreated males assembled, counseled, and sent two emissaries to plead with the rampant collegiate Amazons. The said emissaries were immediately captured and held as hostages in the sorority house. There were other charges, and counter charges and so on and on, until both sides got acquainted and decided to hold a dance at the same time and in the same place - wherever that was.

At the dance -- or was it merely a dance? -- some one was conscious that a tall boy was standing by the door looking lone. But she didn't do anything about it -- not right then. This was years and years ago, you must

remember. This girl, whom the tall and lonely boy kept watching at the dance, had an early class and left the sorority house at seven in the morning. At first the lonely boy, breakfast getter for other boys, merely came out on the porch and coyly waved his hot cake spatula at her, but soon he was carrying her books as far as the car line, and the next thing he knew he was dating her three nights a week and insisting that she was the only girl in the world. (She found out later that he wasn't studying books the other four nights, either.) There's only one true and possible for a chapter like this, and it is yet to be. Let us hope that it is far, far away.

Harry came to Ventura when he was graduated and went to work for Charles Petit, the present county surveyor. His first job was the laying out and supervising construction of the paved highway from Santa Paula to Fillmore. This was followed by several years of countrywide experience on bridges, dams, roads, and general construction. Later he became the first engineer to locate in Santa Paula and (in spite of pessimistic warnings of well meaning friends) was successful from the beginning. From then on until 1929 he was too busy taking care of his work and his ranch to permit any leisure. When the depression struck he found that he had time to do something that he had always wanted to do, so he bought an aeroplane and learned to fly. His particular reason for wanting to fly was to make it possible to use aerial maps in studying engineering problems. This training has been valuable in his present work, and the California Project of the United States Soil Erosion Service has a complete file of aerial maps as well as men able to make and use them.

We must tell one story of his flying. Two elderly and intensely religious ladies were delegates to a

church conference in Santa Paula Mr. Reddick offered to take them up for a top side view of the valley, and they were willing, provided he was sure that he wouldn't take any chances. He assured them and the flight was on. Everything went well until he started to land, and then he went into a routine of zooms, side-slips, dives, and what-have-you's, that made the hearts of the spectators pound like a Model-T with mail order pistons. It took ammonia to revive his passengers when the ship finally landed, and after they had offered fervent thanks (not for the ride, but for being back on the ground alive) they asked why he had so endangered their lives. "I was trying to shoo a cow off the landing field," he explained casually -- and again the ammonia revived them. The topic discussed that afternoon at the religious conference was "How it feels to

fly with Harry Reddick."

Mr. Reddick originated the system of contour strip terraces, now generally used in Southern California, on steep slopes. It was his knowledge of agricultural engineering that enabled him to develop this method of planting and fits him so admirably for the post of Regional Director of the U. S. Soil Erosion Service of California. Just now he's very busy on a great big job, but he's just as approachable, just as human, and just as much "on the level" as he has been thru those long years since he first came to Santa Paula. He has a home up Ojai Road, and there with his two sons, his daughter, and that girl he used to wave the hot cake turner at from the steps of his fraternity house, he lives when he's not erosion-eering in some other part of the state.

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Soil Erosion Service
Santa Paula, California

Oxnard, California
December 11, 1934

Gentlemen:

Acknowledging receipt of your letter of November 30th and contents noted.

I was greatly pleased to receive the print of the aerial map, as well as submitting information as to the work that is still to be completed.

On my recent visit to the ranch I was more than pleased with the different detailed work that had been done to date and I feel sure that in years to come that the work that is being done will prove of great benefit to all parties concerned.

I will be pleased to meet with your men at any time that they may suggest in order to discuss further details in connection with the various planned and other features of your work.

Yours very truly,

(signed)

Alfred Fasshauer.

EXPERIMENTS ON ABSORPTION, RUN-OFF, AND EROSION
Leonard Schiff, Junior Agricultural Engineer

Experimental work in erosion control may not only serve to determine factors influencing erosion and the relations of absorption, run-off, and erosion, but also suggest to the agriculturist and the Soil Erosion Service, on a cooperative basis, the value and comparative value of various types of erosion control methods. Experimenting directly on the land on which the various control measures are being practiced may prove influential and valuable in the following ways: the selection and spacing of control methods; the necessary capacity and grade of ditches and outlets; and the economical design of structures.

California Region Number 7, of the United States Soil Erosion Service, realizing the value of experiment in the relatively new field of soil erosion control, the magnitude of the problem, and the importance of its solution, has established ten silt and runoff gaging stations, four of which are equipped with automatic stage recorders. Ten dams for special study, seventeen government and private rain gages, sixteen wells, and nine drainage areas have been located in the project area to aid this study.

Briefly, the objects of the study, for which data is being gathered may be stated as follows.

1. Runoff and silt loss of watersheds and small drainage areas varying as to area and its configuration, vegetation, soil, type of cultivation, and slope.
2. Gully runoff for economical and capacity design of erosion prevention structures, discharge coefficients, and volume and stabilizing grade of retained silt.
3. The use and value of such erosion control methods as strip cropping, terracing, and contouring in their relative influence upon decreasing runoff and silt loss in correlation

with the duration, precipitations, and intensity of rainfall.

4. The controlling grade in ditches and outlets for no deposition or cutting as influenced by type of soil and cross slope.

Rainfall data of past years, including the 42-year Snyder record, have been gathered from agriculturists of the Las Posas area. The accompanying charts, numbers 1, 2, and 3 (see page 1 of charts on the following page) illustrate the data and are useful in the prediction of precipitation, cycles, storage, and runoff for method of control and design.

Chart number 4 (see page 2 of charts) briefly describes the watershed, precipitation, and consequent runoff of 3 runoff gaging stations, and illustrates the influence of area, slope, and native cover. Milligan Barranca, although slightly less in area and per cent slope than the Colorado Barranca, has a much greater flow due to its lack of native cover. The Honda Barranca has a much lower flow than either the Milligan or Colorado Barrancas, due to the fact that it has the least acreage, gentler slopes, and the greatest percentage of native cover.

Experimental work includes gathering of data from silt and runoff gaging stations on the major watersheds and from culverts and natural channels on the small drainage areas, which range from 20 to 75 acres, and vary as to methods of control. Data are gathered as to the gage height of water flowing over dams and the duration, precipitation, and intensity of rainfall. Periodic gaging of wells leads to information as to depth of subsurface water. All data are gathered in reference to time and correlated for knowledge as to absorption, runoff, and erosion, and practical control methods.

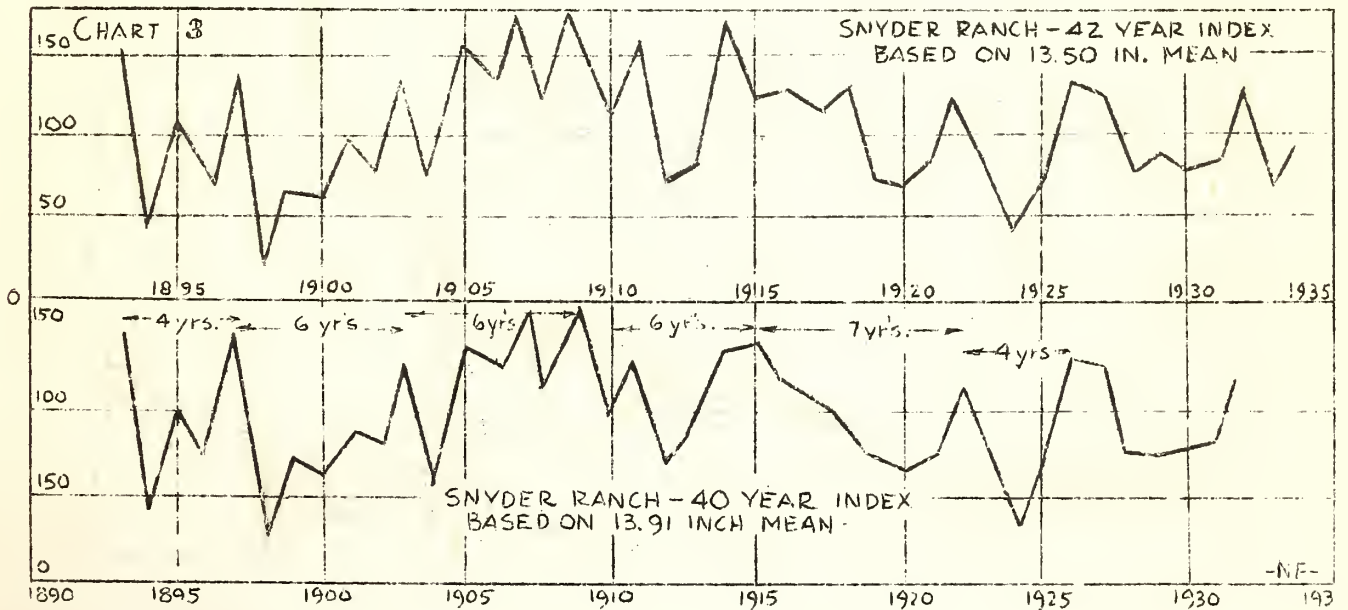
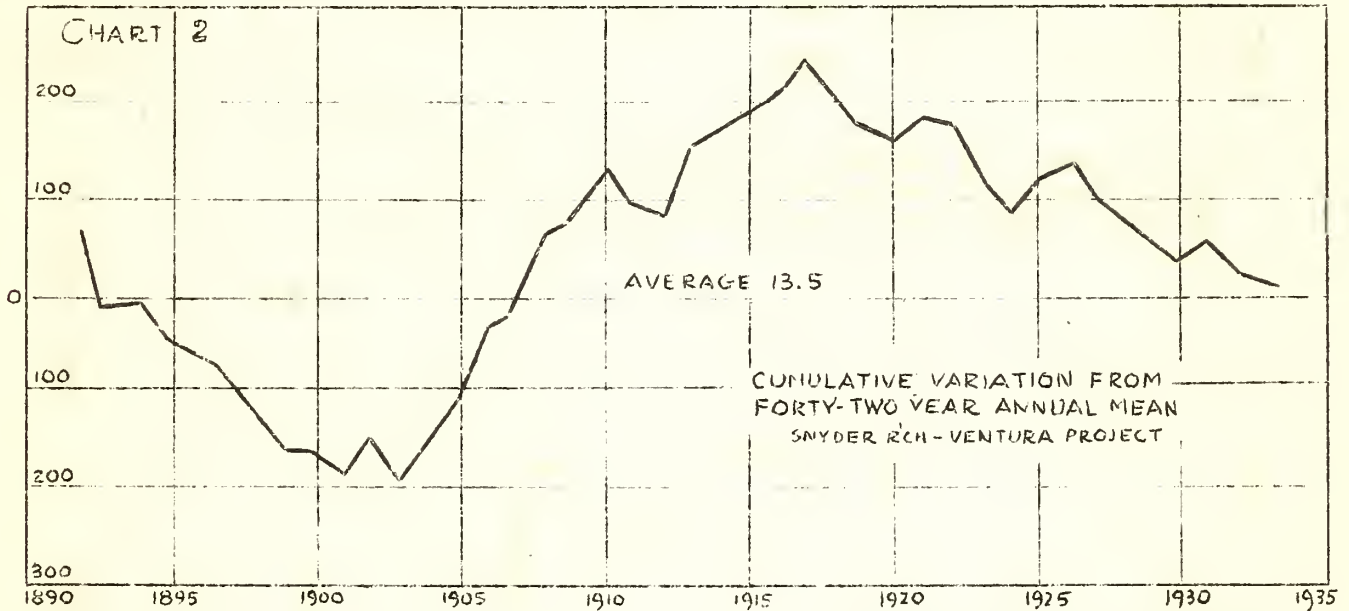
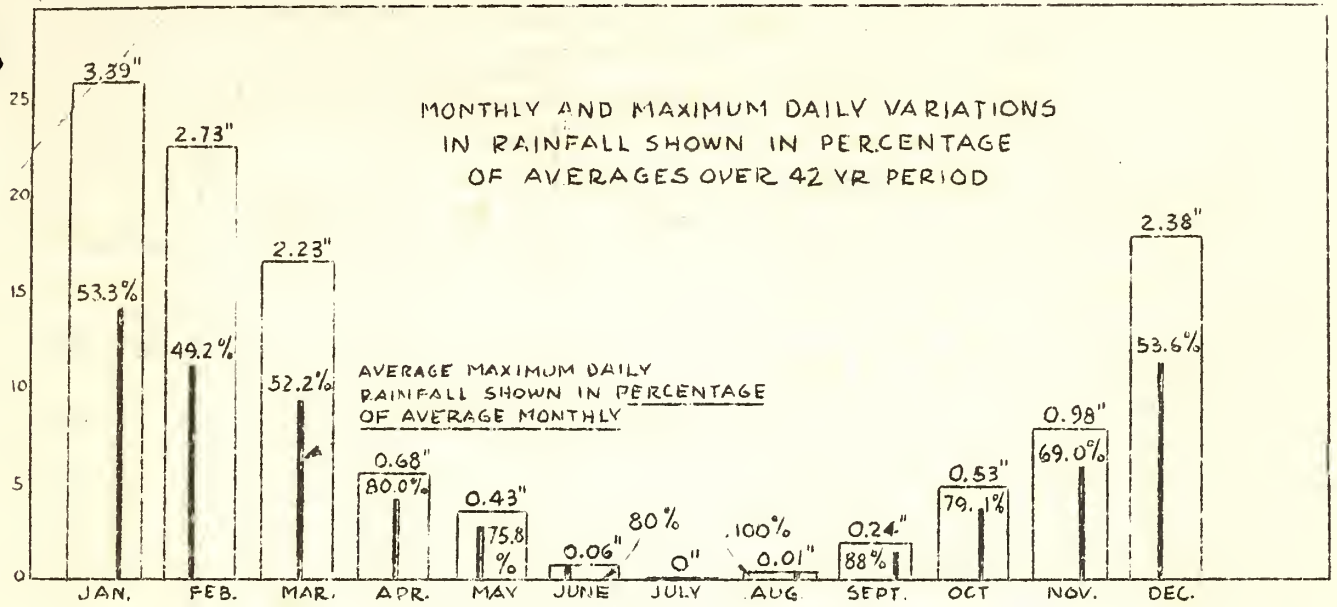


CHART NO. 4.

STATION	RAIN-FALL DATE	PRECIPITATION IN INCHES	DESCRIPTION OF WATERSHED			RUN-OFF IN CUBIC FEET
			ACRES	% WATERSHED OVER 40% SLOPE	PERCENT NATIVE COVER	
MILLIGAN BARRANCA AT BERYLWOOD RD.	11-15-34	1.28	825	51	0.50	64,800
	11-17-34	0.52				3,600
	11-19-34	0.92				198,000
COLORADOS BARRANCA AT BERYLWOOD RD.	11-15-34	1.28	1065	56	71	32,400
	11-17-34	0.52				1,400
	11-19-34	0.92				71,280
HONDA BARRANCA AT BERYLWOOD RD.	11-15-34	1.28	735	43	74	4,320
	11-17-34	0.52				300
	11-19-34	0.92				14,850

RUN-OFF AND SILT GAGING STATIONS
LOCATED ON A PORTION OF THE LAS POSAS
AREA WITH WATERSHEDS AS OUTLINED AND
DESCRIBED ABOVE.

